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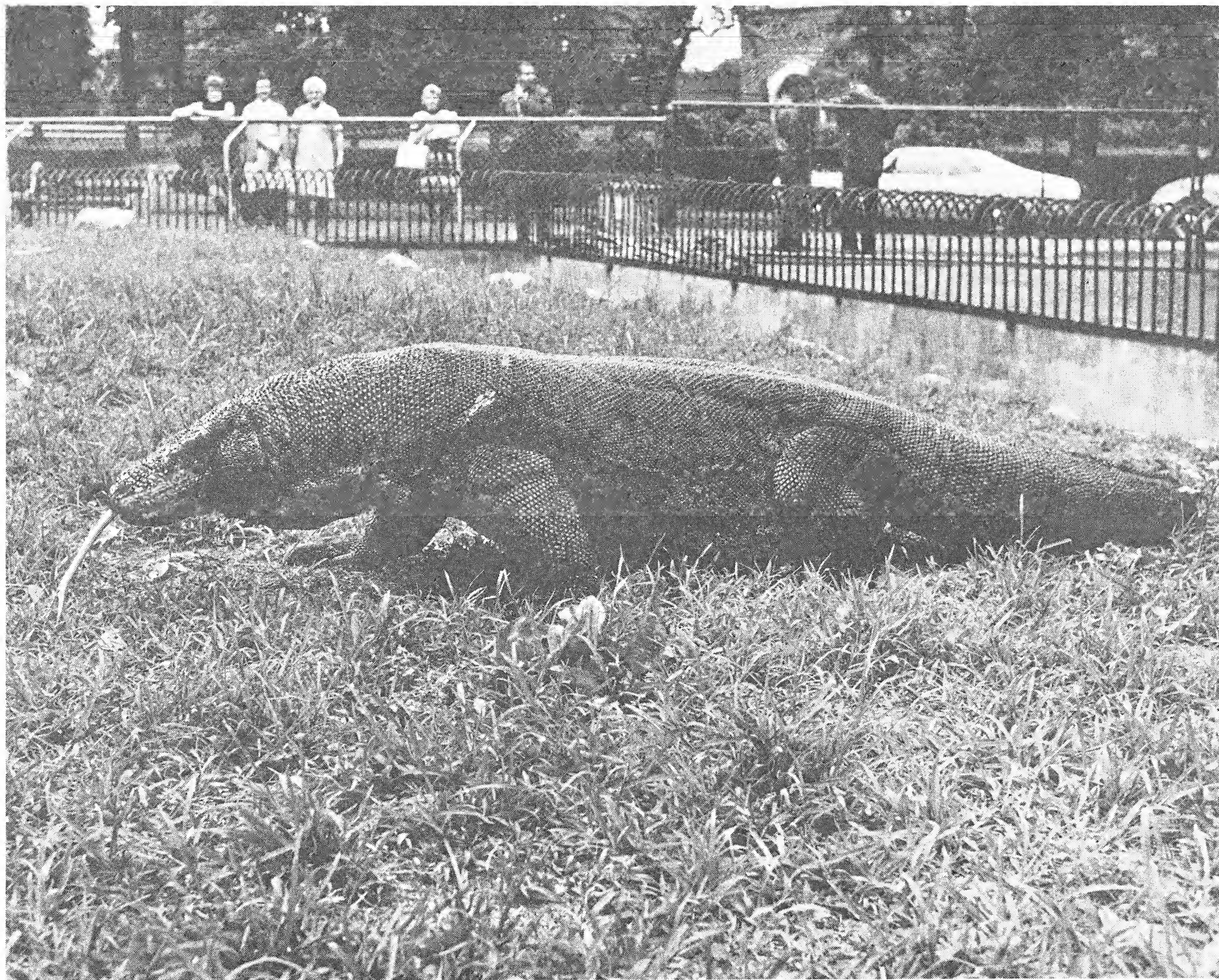


SPOTS and STRIPES

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—Photo by Delvecchio

Kelana, "the Wanderer", settles down in the National Zoological Park

KOMODO DRAGONS

(The greater part of this material is based on a paper presented by Dr. Reed to the International Union of Directors of Zoological Gardens in 1965 in Berlin. Much of the research for the paper was done by Sgt. Marvin L. Jones, who, while pursuing an Army career, has devoted many years to a study of zoological gardens and their inhabitants.—Ed.)

In 1929 Dr. Mann and I were in London for the celebration of the one-hundredth anniversary of the London Zoo. Naturally, we spent a great deal of time in Regent's Park and particularly in the reptile house, which at that time was considered the finest in the world. I still remember one lovely exhibit—a tiny, brilliant blue frog sitting motionless on a broad green leaf, looking as though it had been carved from turquoise. The star of the collection, however, was a Komodo dragon, the first that I had ever seen. One of the great sights of the Zoo was to watch the young curator, Miss Joan Proctor, taking the enormous lizard out for a walk. It followed her as obediently as a well-trained dog.

I next ran into dragons eight years later on the National Geographic Society's expedition to the Netherlands East Indies. Bill Mann and I had spent six months in Sumatra collecting animals, and made a short trip to what was then called Siam just before starting on the long sea voyage home. A pair of *Varanus komodoensis* had been sent to our freighter in Singapore as gifts from the zoo in Soerabaia. They were already in the hold of the ship when we boarded it with our Siamese gibbons, cobras, white squirrels, and numerous birds. Our next stop was to be Belawan in Sumatra, where the bulk of our collection was to meet us. We were under way and peacefully eating dinner that first night when one of the crew came into the dining room and told us a lizard had escaped. Thinking it was one of our small geckos, Bill stopped by our stateroom, picked up his indispensable butterfly net, and climbed down into the hold. He was gone a long time and I wondered idly what he was doing.

"It was the Komodo dragon that was loose," he said. "I looked pretty silly going down there with a butterfly net. None of the crew would help me and I couldn't handle him by myself. We'll have to wait until the boys join us tomorrow. In the meantime I have moved all the bird cages out of the dragon's reach."

And the next day the loading of nearly nine hundred live mammals, birds and reptiles had to wait until the whole expeditionary force (four men

including a Borneo Dyak boy) caught *komodoensis* and nailed his cage securely shut.

Those were the first dragons, in 1937, to come to the National Zoo. In March, 1964, the Zoo received two fine specimens as gifts from President Sukarno of Indonesia. Dr. Reed was given permission to choose two animals from the Zoo in Soerabaia, which he then escorted back to Washington.

The larger, the male, was 8 feet 11 inches long, and weighed 176 pounds, while the other was 6 feet, 2 inches in length, and weighed 54 pounds. The animals were crated in Soerabaia and taken by rail to Djakarta, whence they were flown to Washington.

The Komodo dragon, or land crocodile as the natives call it, is the largest and heaviest lizard in the world today. The record measurements were for an animal received in June, 1933, at the St. Louis Zoological Gardens. It survived only two weeks and upon its death weighed 365 pounds and was 10 feet 2 inches in length. There have been exaggerated stories that the length of the Komodo dragon goes up to 30 feet, and many people have reported seeing dragons that were at least 12, 13, or 15 feet long. Dr. Ripley, Secretary of the Smithsonian Institution, was himself a victim of these exaggerations, when his book on Indonesia in LIFE's Nature Library series quoted him as saying "the dragon reaches a length of 12 feet". This statement occurred because a junior editor had the nerve to change the text by adding two feet to the length of the lizard.

Among its distinguishing physical characteristics is the yellowish-white forked tongue, which in other Varanid lizards is dark, usually bluish in color. The flicking in and out of this tongue without the parting of the lips is undoubtedly the source of the "spitting fire" impression, and hence the name dragon.

The ear openings are quite large, and prominent when the neck is held straight. Many claim that the Komodo dragon is deaf, but Jaren Horsley, Curator of Reptiles, is currently working on an experiment to disprove this thesis.

The skin gives a hobnail effect, seeming to be composed of many nailheads close together, giving a decidedly chain-mail or armored appearance. There is more truth than fantasy in the similarity, since the skin contains bone spicules in these so-called knobs which make the skin extremely hard

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and completely worthless commercially as leather—a fact which has saved this species of *Varanus* from the tanner's pit.

Coloration of the skin in mature animals is dark brown to bluish black. In young animals there is orange and green coloration in a pattern similar to other *Varanus* species. Shedding of the skin appears to be in irregular patches. There does not seem to be any record of the pattern of skin shedding, frequency, or seasonal variance.

The teeth are short and are curved backward and are extremely sharp. They can inflict a nasty wound and are capable of tearing out large chunks of flesh from the bodies of their victims. The neck is long but not exceptionally so in comparison with other lizards of this family.

The claws, five on each foot, are generally gently curved and are not particularly sharp. However, the strength and power of this beast make them formidable ripping weapons which can inflict great damage.

The Komodo dragon differs in its walk from other lizards in that it is an upright animal, carrying the body completely off the ground. Only the very tip of its tail drags, and the lumbering gait of these animals belies the high rate of speed which they can put forth for short periods of time.

This remarkable animal is found in a very restricted area, being confined to the three small islands of Komodo, Rintja, and Padar, and the western end of the major island of Flores. These islands, among the 3,000 that make up Indonesia, lie east of Java.

Although the islands are only a few degrees below the equator they are extremely harsh and very untropical. The vegetation is sparse and is apparently dry for a good part of the year; there is no standing or continuously running water. Vegetation seems to be more like tropical savannahs than trop-

ical rain forest, and the climate is much drier than that of Java, Bali, and Lumbok, which are in the same latitude. In the savannah or lower areas on these islands there is a palm (lontar) that gives character to the landscape. In the higher regions there are bamboo groves, and scatterings of trees similar to the apple but containing thorns.

Other animals found in these islands are deer, wild pigs, some palm civets, and a variety of birds including parrots and pigeons. Macaques are found on the island of Rintja, and on Rintja and Padar rats seem to be rather common. There are wild horses on one of the islands and on Komodo apparently there are some buffalo that have gone wild.

The Komodo dragon reproduces by laying eggs, apparently 20 or 30 in a clutch. Infertile eggs have been laid in various zoos, including the NZP, and there have been at least three hatchings that we know of in Indonesia. The first occurred at the Djakarta Zoo in 1942, and one of these hatchings is still living in the Soerabaia Zoo, now measuring about 2 meters in length, showing the extremely slow growth in these reptiles. In a hatching at the Jogjakarta Zoo in 1964, 26 or 28 eggs produced viable young, of which several pairs were sent to various zoos.

In the wild, the young animals seem to be slightly arboreal and it is even stated that they sleep in the trees. As they become older and heavier, they spend their nights in caves, which they apparently dig themselves. The animals have been observed wandering about Komodo in the middle of the night, although they are mostly to be seen during the day, after the temperature has reached about 80° F.

In the wild, there seems to be little food of animal origin which they will not eat, and they are not particular about its being fresh. Some people believe that they are strictly carrion eaters; others believe that they attack and kill deer and pigs. There is only one recorded instance of a Komodo dragon making a kill, and this was of a monkey on the island of Rintja. It is supposed that the lizards lie in wait along game trails and then pounce upon deer and hogs. Certainly they are large and vicious enough to dispatch one of these animals. They have been observed patrolling the coastal beaches, apparently searching in the debris for shellfish and other material washed up by the tides. They have been known to dig out and eat the eggs from the nests of megapodes and sea turtles. The dragons are capable of swimming, but they are not considered

vigorous swimmers and apparently do not hunt in the water.

The dragons are currently under the protection of the Indonesian Government, who are well aware of the animal's value, rarity, and their responsibility toward preserving it.

Of the two lizards received here in 1964, one, the large male, died after a little more than two months. It was discovered that both animals were infected with amoebae. Heroic measures were instituted to save the surviving one, and they proved successful. Rini, as she had been named, has laid eggs several times, and negotiations were begun with the Indonesian Government to procure a mate for her. In June, 1970, shortly after the state visit to this country of Indonesian President Soeharto and his wife, a large and handsome male, which has been named Kelana ("the wanderer") was presented to the National Zoo as a gift from the Indonesian government. Kelana is 8½ feet long and weighs 238 pounds. He and Rini have settled down amicably in their summer outdoor quarters, and everyone is hoping that some day the Zoo will be blessed with baby dragons.

—Lucile Q. Mann

ZOOKEEPER TRAINING PROJECT

In 1968, "Zookeeper Training, A Suggested Guide for Instructors" was published by the American Association of Zoological Parks and Aquariums, pursuant to a contract with the Department of Health, Education and Welfare.

The booklet was prepared with the assistance of a consulting committee made up of directors of U.S. zoos and aquariums. The purpose of the guide was to establish a zookeeper training curriculum which covered all those aspects thought to be relevant to the practical application of zookeeping. In addition to each unit outline, discussion questions, teaching suggestions, laboratory activity, reference texts, and lists of available visual aids are offered.

The basic course is divided into 20 units for 56 hours of classroom instruction and 63 hours of laboratory activity. Unit subjects range from the more theoretical treatments of basic biology, anatomy and physiology, reproduction and genetics, and animal behavior, etc., to the applied techniques of animal restraint and handling, identification marking, sanitation and feeding, etc. Supplemen-

tary elective units are outlined for the more specific study of mammals, birds, reptiles, fishes, invertebrates, and separate units covering children's zoos and central food preparation.

As the publication neared completion it was decided that it should be immediately tested for its utility under actual zoo conditions. A National Zoological Park proposal for a two-phase, 12-month pilot keeper training project was submitted for grant funding once again by HEW's Office of Education. An allocation of approximately \$40,000 plus \$20,000 worth of trainee allowances was approved, and the project began on December 15, 1969.

Phase I was divided into two 10-week training periods for the up-grade instruction of those keepers at the National Zoological Park who were working below the supervisory level. Classes took place for three hours each Tuesday, Wednesday and Thursday afternoon. Each Monday during the first training period, the headkeepers of each division met with the training staff to discuss the week's course material and to bring into the training the experience and knowledge of these more senior keepers.

Phase II, which begins on September 1, 1970, will be a 20-week training period for unemployed adults from the Washington-Baltimore area. Training will consist of half-day classroom and laboratory sessions and half-day periods of cooperative work experience assisting our regular keeper force.

Having completed the first phase of up-grade training, we are already forming opinions on the functionality of the guide and gaining new ideas on the course's organization, teaching techniques, and relevance to the actual, everyday task of zookeeping.

Our experience clearly illustrates that we must first instill in our keepers or the potential keeper a love for and interest in animals, cultivating both to as high a degree as possible. Armed with this motivation, they will be much better equipped to concentrate on the learning of keeper techniques and the biological rationale for them.

Based on our previous experience, we know that the basic biological concepts must be expressed only on the very level that a keeper will utilize them through the practice of his newly acquired techniques. Verbalizing a concept must immediately be followed by visual examples, familiar historical cases and, most important, by on-the-spot



—Photo by Rapho Guillumette

Dr. John F. Eisenberg, Resident Scientist at the National Zoological Park, lectures on animal behavior to a keeper-training class.

demonstrations of the concept's applicability in a work situation.

At this point in the project we can look back to 1968 and appreciate the endeavors of the AAZPA's first step in launching into this area that has been so long neglected. We can also look back to our own experience of the past six months, knowing that we are making progress in a course that is rather unusual in its demands and application. We hope to achieve success by new approaches and the revisions and additions that we intend to make. Most important, we trust that the end result will be the improved care and maintenance of zoo animals throughout the world.

—Warren Iliff

REPORT ON ASIAN ZOOS

On a whirlwind tour of Southeast Asia and Japan with the Smithsonian Associates Foreign Study Tour, I was able to add three zoos to my "life list." First came the Dusit Zoological Park in Bangkok, which I visited with one of my traveling companions. We were cordially received by the Director, Col. Suthas Sukhamvat, who gave us glasses of iced tea and inquired about his friends in Washington. His office is in a new building, refreshingly cool and with ample space for the staff. We then met Dr. Thavil Kuptabutra, Assistant Director, who took us around the Zoo.

It was a sizzling hot day but the nicely landscaped 30-acre park was shady and comparatively cool. The central part of the park is a large lake for waterfowl, with animal exhibits grouped around it. Notable animals were Eld's deer, douc langurs, and a banteng calf born in the Zoo.

The reptile house is a new one-story building, with large windows into which the visitor looks to see the specimens inside. There is no visitor space indoors but excellent viewing from outside. It appeared to be a nice collection, including a huge python.

On March 27th I was in Taipei and went to the Zoo there with Pat Carpentier (husband of Evelynne, former secretary to Dr. Mann) and a Chinese friend of his, Mr. Wong, who acted as interpreter. The Director of the Zoo (Tsay Ching-chih) was not there but we met the Veterinarian, Dr. Jeng-shyong Tsay, Acting Director. He spoke no English but Mr. Wong was an excellent interpreter. The first exhibit, on the left as you enter the Zoo, is a large glass case containing very bad examples of native taxidermy. There were a huge orangutan, various cats, deer, and some birds, and Dr. Tsay explained that these animals were in the Zoo at the outbreak of World War II and had to be shot lest they escaped during bombing of the city. Next to this exhibit is the Director's office.

The route through the Zoo follows a circular path which, because it was raining, was deep in mud. My heavy shoes kept sticking in the mud and I almost walked out of them; also the footing was slippery, but I followed the path, up the side of a hill and down again to the entrance gate, without mishap. The Zoo covers 10 acres and the admission is NT \$2 (5 cents). By American or European standards it is pretty primitive, but the animals appeared to be in good health and well taken care of. There were two giraffes, one reticulated and one Masai; two black rhinos and two white rhinos, just arrived from Africa. The four rhinos were side by side in temporary stalls, but new quarters are being built for them. New quarters are also being built for kangaroos which I understood would be arriving soon. There was a good sea-lion pool, and a spacious enclosure for penguins; the two Humboldt penguins were not in the pool or on the rather elaborate slides but in a small compartment which I was assured was air-conditioned. A Vietnam peacock was the most gorgeous specimen of this bird that I have ever seen; he was on a perch some 6 or 7 feet high, with his back to us, and his tail nearly touched the ground. The cage was rather dark, but the background color of his tail seemed to be a reddish brown with glowing green and gold "eyes". There were Stanley cranes, pelicans, and duck ponds, also Formosan magpies. Many smaller birds were in cages so dark that they could scarcely be seen. The big surprise was to come across a Formosan serow, a young male. I exclaimed that I did not believe there was a single one in the United

States, and Dr. Tsay agreed with me. There was also a Formosan leopard cat, and I was much impressed by the size of the Hokkaido bears—they are much larger than the European brown bear, with long shaggy coats. A group of three lionesses and a Himalayan bear were living together in one cage; they are a trained group and put on a show daily.

I was puzzled by Dr. Tsay's frequent comment that the giraffes, for instance, were from Japan, or the Stanley cranes from South America, but finally realized that he meant these animals had been obtained from zoos in other countries. I said that I had not seen any North American animals, and he said it was because he did not know any zoo people in the States. He further said that I was the first American zoo person to visit the Taipei Zoo, which seems astonishing. Surely Marlin Perkins has been there? Perhaps incognito.

On April 3 Dr. Tadamichi Koga, former Director of the Tokyo Zoo, picked me up at my hotel and took me out to Tama. This Zoo is 11 years old, covers 42 hectares (105 acres), and has a million visitors a year. It is 30 miles from the center of Tokyo, but because of the traffic it takes two hours to drive there. We had lunch in the zoo restaurant which was packed and jammed with school children, this being spring vacation. Instead of a menu, the restaurant shows pictures of dishes available, and you point to a picture of what you want.

After lunch we walked to the insectorium in the pouring rain, and here was a delightful exhibit. The first room you come into is a museum room, with mounted specimens of all kinds of insects. The curator is Mr. Minoru Yazima, who speaks a little English, and he was pleased when I told him that my husband had been an entomologist before he became a zoo director. We were joined by the Director of Tama, Mr. Ishiushi, and the three men accompanied me all afternoon. From the museum room you pass into a large room with living insects in all stages, from egg to larva to pupa to adult, all beautifully shown. Then there is a nocturnal room with insect-eating animals—a large owl, bats, two species of loris, douroucoulis (these are breeding and I understood Dr. Koga to say that there were young born twice a year), flying squirrels (the big Japanese species), and others. The red light was the best I have seen; the animals were alert and active and could be plainly seen behind the glass cage fronts.

From this building we went to an adjoining one which has a large greenhouse. It was full of cineraria, pansies, primroses, poinsettia, and one or two heads of cabbage. It was wonderful to step into this warm and fragrant room out of the cold rain, and find live butterflies flitting everywhere. It was a fairyland of color.

The insectorium opened last September, and is not yet completed. It has a good-sized auditorium where lectures are given every Sunday.

The African veldt, which can be viewed from the restaurant, has rondavels with thatched roofs as shelters for wildebeests and zebras. A large area for lions is toured in a bus with big windows. Nineteen lions of both sexes ambled around, coming close to the bus at times, and at other times crossing the road in front of the bus—"lions have the right of way." It was like Lion Country in West Palm Beach but on a smaller scale.

The bear pits were very attractive, as were the moated enclosures for tigers and cheetahs, spacious, with artificial rock backgrounds and well planted with trees, grass, and shrubbery. Again I was impressed with the size of the Hokkaido bears. Tama also has Himalayan and Malay bears, and there are foxes living in a den in the bears' enclosure. The foxes do not venture out when the bears are roaming around, however. There are two Korean tigers, both females; and the two cheetahs, with plenty of space available, made a fine showing.

Sika deer wander loose around the grounds. There are also sambar and nilghai. There is a big collection of cranes, a walk-through aviary filled with Japanese birds, and an aviary for eagles of several species. There is a monkey island (Japanese macaques), a gibbon island, and a chimpanzee island. The elephant yard is being enlarged, and I plowed through mud, with Dr. Koga holding an umbrella over me, to see just how the moats are constructed.

Back at the hotel, Dr. Koga waited while I changed from my muddy shoes to something more respectable. Then we picked up Mrs. Koga and went to a marvelous Japanese restaurant for dinner which included three kinds of raw sea food (one was ovaries of sea urchins), a small whole cooked fish, fried shrimp, crab, pickled vegetables, two kinds of soup, tea, rice, beer, and sake.

P.S. I survived!

—Lucile Q. Mann

RECOMMENDED READING

Birds in Our Lives. Alfred Stefferud, Arnold L. Nelson, Editors. Bob Hines, Artist. Arco Publishing Co., New York, 1970. 447 pp. Library Edition \$9.00, paperback \$5.95.

"Birds in Our Lives" is a compilation. Fifty authors, many of them in the Department of Interior, Fish and Wildlife Service, others from museums and universities throughout the country, and from the Audubon Society, have contributed to it on a variety of subjects. It is hard to think of any way in which the lives of birds touch the lives of man that is not covered here. Birds in art, birds on stamps, birds on coins, hunting, falconry, photography, feeding stations, birds in homes and in zoos, birds in cities (incidentally, Glover-Archbold Park in Washington is considered one of the best areas in any city for bird watching), birds on farms, the effects of pollution of air and water—all come in for a non-technical, absorbing discussion.

In the chapter on "homing" we read: "The feats of homing by displaced birds are indeed astonishing. A purple martin was removed from its nest in northern Michigan, was taken by car 234 miles south, was released at night, and was back at its nest in the morning—8 hours and 35 minutes later.

"A Manx shearwater transported from the coast of Wales to Boston and released there returned to its nesting hole 3,200 miles away in less than 13 days. Since the ocean offers no landmarks and since the return was far too rapid for any form of random searching, we must conclude that it used some set of precise clues in the environment."

In the chapter called "We Are Warned" the author says: "Oil jettisoned off Newfoundland in 1960 was reported to have killed 250,000 razor-bills, eiders, murres, and puffins." Other horrifying examples of pollution are cited.

The 400 photographs, by many different people, are uniformly excellent, and the wash drawings, by Bob Hines of the Department of Interior, add greatly to the interest of the book.

* * * * *

The World's Vanishing Animals. Cyril Littlewood. Published by Arco, New York. 63 pp. Illus. 1970. \$4.50.

"The World's Vanishing Animals" lists 96 species of mammals which may disappear from the earth

unless the human race learns to respect and protect the ones that are left.

Cyril Littlewood is founder and director of the Wildlife Youth Service of the World Wildlife Fund, and for every copy of his book that is sold, a royalty is paid to the World Wildlife Fund.

While it is primarily aimed at young people, older readers will find it a convenient reference. Illustrations in full color accompany the description of each animal, whose scientific name, habits, and habitats are given. Maps show the geographic distribution of each species.

There may seem to be an over-supply of books on the subject of vanishing animals, but this is a crucial time in which we live, and every contribution that might possibly arouse interest in the protection of our fauna should be welcomed. This little book is recommended as a start for those who have not already read widely on the subject.

—L.Q.M.

ZOO NIGHT

Friday, September 25, 1970

5:30 p.m. — 8:30 p.m.

The theme for Zoo Night is "Introduce a friend to FONZ." Members are invited to bring a guest or guest family who they think will be interested in supporting our aims. Reservation forms will be sent to members. Membership information and forms for guests wishing to join the Friends of the National Zoo will be available on Zoo Night.

On Zoo Night:

All houses will be open

The train will be running free

There will be free liquid refreshments

The new FONZ office in the basement of the restaurant building will be open

The FONZ Kiosk will be open with special new items for holiday gift giving

FONZ balloons will be on sale

Music and all that jazz!

Bring a picnic supper and be sure to bring the children!

Would YOU like to dispense beverages on Zoo Night? If so, call the FONZ office — 232-4555.

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FONZ ACTIVITIES

Mrs. Anne Morton, Executive Secretary, is hoping to start a short series of Saturday morning Zoo Art Workshops for children of FONZ members—the details are just now being worked out. Mrs. Gerald Bidlack, chairman of the Art Committee, has offered her services for the first experimental sessions. Right now, Mrs. Morton and Mrs. Bidlack are anxious to find members who would like to become actively involved in this project. Call Mrs. Morton at 232-4555.

There will be a special Fall training course for new FONZ guides, probably during the first week in October. The FONZ guide program is one of the most important volunteer activities available to members. People who are genuinely serious about volunteering should call Mrs. Cynthia Turner at the guide number: 332-9322. Leave your name and telephone number and Mrs. Turner will contact you. Being a Zoo-trained guide is one of the most rewarding and vital services we offer to the area schools. Last school year *over 12,000 school children* were personally conducted through the National Zoological Park animal collection by our elite group of guides.



“To operate exclusively for educational and charitable purposes, and in particular to educate the general public on matters relating to the increase and improvement of the facilities and the collection of the National Zoological Park, and to foster its use by the general public and the schools for educational purposes”—

Memberships:

Contributing	\$25.00
Family	15.00
Regular	7.50
Student	3.00

All memberships include subscriptions to SPOTS AND STRIPES, invitations to special events, annual meetings, and Zoo Night.

If you wish to join, send in your name, address, and telephone number with check payable to Friends of the National Zoo, c/o National Zoological Park, Washington, D.C. 20009.

Lucile Q. Mann, Editor
